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ABSTRACT

Pre-service teacher training should offer the future teacher necessary skills for employing technology to teach a curriculum in creative and effective ways, and the awareness of the possible dichotomy to be faced in the schools between what can be done and what should be done in using technology in teaching. This paper describes such a pre-service teacher technology training course, as well as a survey of technology use by the students of the course during actual service in the classroom. Although the course encouraged future teachers to focus on the potential of the computer to develop problem-solving in the classroom, survey results indicated that in reality, such use was limited. Questions are proposed for consideration in defining the steps to be taken in narrowing the gap between what can be done with technology in the classroom and what should be done with technology in the classroom. (Author)

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Pre-Service Teacher Training and Implementation in the Classroom: Considerations

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Abstract

Pre-service teacher training should offer the future teacher necessary skills for employing technology to teach a curriculum in creative and effective ways, and the awareness of the possible dichotomy to be faced in the schools between what can be done and what should be done in using technology in teaching. This paper describes both such a pre-service teacher technology training course, and a survey of technology use by the students of the course during actual service in the classroom. Although the course encouraged future teachers to focus on the potential of the computer to develop problem-solving in the classroom, survey results indicated that in reality, such use was limited. Questions are proposed for consideration in defining the steps to be taken in narrowing the gap between what can be done with technology in the classroom and what should be done with technology in the classroom.

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Recently, the development of the World Wide Web and the Internet has presented an unprecedented challenge to educators. As communication becomes more instant, paradigms shift, especially in areas of teaching/learning, assessment/evaluation, skills/curriculum, and teacher education (Flake, 2001). The challenge is to ease the conflicts that arise from these paradigm shifts, especially the conflict existing in widely disparate levels of comfort between teacher education students and the classroom students they will teach (Flake; Levine, 2002). The present study describes skills learned in a required pre-service teacher course, and a subsequent survey of their use of technology once in the classroom. Forty-two undergraduate pre-service teachers in a large southeastern university participated in an online survey that gathered specific information. This information indicates various factors in the equation for successful implementation of technology in the schools.

The Course

The pre-service teacher course "Technology and Learning for Elementary and Middle School" was designed to guide the students in using the World Wide Web to develop an electronic teaching portfolio, using basic HTML. In the development of these portfolios (individual Home Pages), students would not only learn about the future directions of the Web, but also acquire new knowledge in meaningful contexts. Students were to incorporate skills learned in such applications as Powerpoint, Hyperstudio, Gif Animator, and Word, and they were required to use the web pages in their Field Experience, a two-week internship in the local schools.

Course objectives responded to guidelines developed by several organizations such as the National Council for Accreditation of Teacher Education (NCATE) and the International Society for Technology in Education (ISTE) that recommended:

- Focus on learning with technology, not about technology
- Emphasis on content and pedagogy, and not just hardware.
- Evaluation and use of computers to support instruction
- Exploration, evaluation, and use of computer-based materials including application and educational software.

The four course objectives were:

1. to develop and use skills in the computer and other technologies and reflective thinking concerning the learning process as tools for life-long learning;
2. to identify and use problem-solving/power learning/creativity/ student-centered learning applications for computers and other technologies;
3. to make use of the World Wide Web and other telecommunications capabilities for developing a social community (including navigating, searching for and retrieving information, publishing and building a foundation for life-long learning), as well as building integrated learning in the elementary classroom; and
4. to identify and discuss computer education issues and emerging technologies as related to the development of problem-solving processes and power learning.

The course was a 3-hour semester course taught by a professor and two graduate teaching assistants. The prerequisite course was an introduction to educational

technology. However, this prerequisite course was not taught uniformly in all schools, therefore, there was a wide disparity in level of computer expertise among the students.

The main assignment, on which the students would work throughout the semester, was to create a personal web page. During this time, students could consult with the instructors both during and outside of class. Students were initially instructed in using basic HTML code, although the use of web page editors such as Microsoft Word, Front Page or Dreamweaver or other html editors was acceptable. These web pages were the course's final product, an Electronic Portfolio which would be evaluated. In creating their personal web pages, students were encouraged to relate their work to other courses in their teacher preparation curriculum. For instance, in creating a theme for the page, a student could use subject matter from another course, for example, art history or poetry.

In an assignment entitled, "Pulling It All Together," students researched three web sites dealing with educational change. These three initial assignments were to compare the issues described in the assigned websites to their own educational experiences. In addition to these sites, the students were directed to the managing professor's website, which contained extensive resources for the students to explore (website of Dr. Janice Flake, http:// http://mailer.fsu.edu/~jflake).

The students were required to include certain applications in the design of their web sites. Each student created a Powerpoint Presentation and a Hyperstudio picture which was posted on the web page. Extra credit was given for posting an original animation on the web page, and experimentation with other computer applications was encouraged.

During a two-week internship halfway through the semester, students were to integrate their web pages into the classroom instruction, both through the curriculum and as enrichment for the children. For instance, each page had a unique theme that was related to the classroom (internship) teaching experience. Students presented their theme-centered web pages, and planned activities related to their web pages. After their internship, students brought back drawings, poems, or other products from the schoolchildren, and could choose to scan those images onto their web pages.

Throughout the semester, students submitted weekly emails to the instructor, reflecting on their experiences with technology. These reflections were then used by the student to compose a Final Reflection at the end of the semester. This Final Reflection emphasized what the student had learned about both his/her own learning, and the learning of the students in the schools where they interned for a two-week period during the semester.

An assignment entitled "Field Experiences" was a two-week long internship during which trainees assisted regular teachers in the elementary and secondary classrooms to which they were assigned. During the internship, the trainees submitted regular journal entries, using e-mail, to the instructors of the course. Students were required to describe the degree to which technology was being used in the schools where they interned, to describe the interactions that they had with the schoolchildren through the technology, and to describe how the children used the Internet, if at all. The students were also asked to reflect on how they would use technology to teach and to reflect on their observations about the development of their own learning and the learning of the schoolchildren who were observed. At the beginning of the course, there was a wide

range of computer experience evident in the teacher candidates themselves. From their accounts of conditions in the classrooms, there was a wide range of experience among the current practicing teachers.

Students were required to familiarize themselves with and review three educational software programs (available in the College of Education computer lab). Examples of such educational software are: KidPix (painting), Algebra Animator (math), Coin Critters (money), and Reader Rabbit (reading). Factors to consider in evaluating software included:

1. Software allows for experimental learning, including explorations, investigations, and building hunches
2. Software is conceptually based
3. Software contains underlying structure of the content to be explored
4. Software allows major cognitive restructuring and the facility for students to construct meaningful knowledge
5. Software allows students to generate feedback from which they can judge the efficacy of their methods of thinking
6. Software is intrinsically interesting enough for students to want to discuss alternative strategies with other students about explorations, hence allowing social constructions
7. Software facilitates reflective abstractions
8. Software is easy to get started.

This requirement provided students with practice in using the computer, and an introduction to professional development and the need for teachers to know and understand what is available in computer programs.

At the conclusion of the semester, students presented their web pages to the class, illustrating the diverse possibilities of using the Internet for teaching. End-of-semester comments from students expressed their positive feelings about what they had learned during the semester, and many expressed their intention of continuing to work on their web page and integrating technology into their teaching and learning.

The survey

The course described was taught for several semesters. To measure the impact that the course had on pre-service teachers' subsequent use of computer technology in the classroom, an online survey was administered within a year of the last semester of the course described. Therefore, some of the students were "closer " to the course than others Some of the respondents were still undergraduates. Of the 42 participants surveyed, 28.6% had completed the undergraduate program and were teaching in the schools. Participants were contacted initially either personally or by email to obtain consent. Results of the survey were automatically emailed to the researcher, and compiled in a spreadsheet.

The following questions were asked on an online survey:

1. Currently, in what semester of the Elementary Education program are you enrolled?

2. In your EDE 4341 class at FSU, you were encouraged to use technology during your field experience. In general, how often do you use information you learned?
3. Since that first semester class, please describe the experience you have had using technology in the classroom.
4. Do you personally use the Internet?
5. Do you use the Internet in your classroom?

(5a) If yes, please indicate which applications you use?

6. How would you describe the effort you made on the personal web page you made in the class?
7. Have you continued to update your personal webpage?
8. How important do you feel technology (computers) is to education?
9. Have you received additional training or other support in the use of technology?

In Question 3, respondents overwhelmingly (26.2%) reported that they used computers in the classroom only for self-use. Of the other uses of technology in the classroom, 7.1% did not use a computer in the classroom, 2.4% used "other" technologies (such as overheads), 2.4% used computers for a variety of tasks, including for resource work, and word-processing, 7.1% reported that computers were not used because there was not enough time in the school day, and 4.8% commented that the school did not support use of technology. However, 4.8% and 16.7% reported that computers were used constantly for CCC and Accelerated Reader, respectively.

In Questions 4 and 5, the majority of respondents used the Internet for personal use (85.7%), with 57.1% using the Internet in class. When the Internet was used in the classroom (Question 5a), it was employed as an instructional tool (9.5%), information tool (38.1%), personal webpage for students (7.1%), and other uses (11.9). Whereas (Question 6) 57% reported that they had "worked steady" on their web page during the course, with 19.0% reporting working "beyond requirements," and 23.8% reporting "minimum" work, 76.2% (Question 7) reported *not* maintaining their web page. Finally, although a majority, 59.5%, reported in Question 8 that they felt that the computer was "very important" to education, in Question 9 only 21.4% reported that they were required to have training by their school, whereas another 21.4% sought additional training voluntarily, and 57.1% had received no additional training in using technology since the course.

Such results highlight the gap that exists between conceptualization and implementation of effective use of technology in education. In spite of general agreement that teachers and staff should be trained in the use of technology (Pettenati & Giuli, 2001; Willis & Raines, 2001), teachers are evidently not receiving adequate support from their schools--whether is procedures, resources or time. Certainly there are other factors that enter into the equation, such as emphasis on test-preparation over lessons, reflected in the number of respondents reporting the use of computers, for example, test-preparation programs (CCC and Accelerated Reader).

What are some questions to be answered that might narrow the gap between what is happening in the schools and what should be happening in the area of technology and teaching/learning? Perhaps in the roundtable discussion, answers can be suggested:

1. How can teachers be guaranteed the time to prepare lessons on the computer, so that skills learned in a pre-service program will "bear fruit"?

2. How can the challenge of re-educating veteran teachers be accomplished?

3. How can the Internet be most constructively used to supplement classroom teaching, considering not only the great variety of resources available (both acceptable and unacceptable to educators) but the need for training in viable search strategies?

4. What is the most effective staff-development scenario that will guarantee a fair and acceptable level of computer use? (see #1 and #2)

For those readers interested in suggesting questions and answers, please send your comments to me by email, using the subject "NECC tech roundtable"--I look forward to seeing you at NECC!

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